

## CLAIMS

### WHAT IS CLAIMED IS:

1. A method of optimizing rotatable inventory, comprising:  
selecting a desired customer service level;  
obtaining at least one characteristic of a part repair lead-time distribution;  
computing a proposed inventory level based on said at least one characteristic;  
determining a calculated customer service level corresponding to the proposed inventory level;  
comparing the calculated customer service level with the desired customer service level; and  
selecting the proposed inventory level as an optimized inventory level if the calculated customer service level is within a selected convergence threshold with respect to the desired customer service level.
2. The method of claim 1, wherein said at least one characteristic is a mean  $\mu$  and a variance  $\sigma$  of the part repair lead-time distribution.
3. The method of claim 2, wherein the step of computing a proposed inventory level comprises:  
refinancing a probability term  $\beta$  having a distribution reflected by a difference term  $\Delta\beta$ ; and  
calculating the proposed inventory as  $I = A \cdot (R - W) - \mu + \Delta\beta \cdot \sigma$ , wherein I is the proposed inventory value, A is a part arrival value, R is a maximum repair time and W is a desired turnaround time window.

4. The method of claim 3, wherein the probability term  $\beta$  is bound by a left bound value BL and a right bound value BR, and wherein the method further comprises:

shifting the probability term  $\beta$  to the left bound value BL and defining a new probability term  $\beta$  between the left bound value BL and the right bound value BR if the calculated customer service level is less than the desired customer service level; and

shifting the probability term  $\beta$  to the right bound value BR and defining a new probability term  $\beta$  between the left bound value BL and the right bound value BR if the calculated customer service level is greater than the desired customer service level and if the difference between the calculated customer service level and the desired customer service level is greater than the convergence threshold value.

5. The method of claim 4, further comprising repeating the computing, determining, comparing and shifting steps until the selecting step is executed.

6. The method of claim 1, further comprising repeating the computing, determining, and comparing steps until the selecting step is executed.

7. The method of claim 1, wherein the desired customer service level is a desired on-time delivery, and the calculated customer service level is a mean on-time delivery, wherein the desired on-time delivery and the mean on-time delivery are represented by a mean of a number of on-time delivered parts per time unit divided by a mean of arrivals per time unit.

8. The method of claim 7, wherein a number of arrivals per time unit is a constant number, and wherein the mean of arrivals per time unit is set equal to the constant number.

9. The method of claim 1, wherein a number of arrivals per time unit is randomly variable.

10. The method of claim 9, wherein the method further comprises:  
obtaining an arrival value having a distribution  $G$  and an inventory value having a distribution  $\Phi$  ;  
obtaining a distribution of the calculated customer service level based from the distributions  $G$  and  $\Phi$  ; and  
conducting the step of the determining the calculated customer service level based on the distribution of the calculated customer service level.
11. The method of claim 9, wherein the method further comprises approximating the randomly variable number of arrivals per time unit with a constant number of arrivals per time unit.
12. The method of claim 1, wherein the method optimizes rotatable inventory for an asset having a plurality of individual parts, wherein the step of selecting the desired customer service level comprises selecting the desired customer service level for the individual parts, and wherein the method further comprises:  
conducting the obtaining, computing, determining, comparing, and selecting steps to obtain the optimized inventory level for each of said plurality of parts;  
summing the optimized inventory level for each of said plurality of parts to obtain a total optimized inventory level;  
calculating a total rotatable inventory cost from the total optimized inventory level; and  
minimizing the total rotatable inventory cost.
13. The method of claim 12, wherein the minimizing step is conducted via a constrained optimization process.

14. A computer system for optimizing rotatable inventory, comprising:
- a user interface;
  - a processor that executes an algorithm to determine an optimized inventory level, the algorithm comprising the steps of
    - selecting a desired customer service level,
    - obtaining at least one characteristic of a part repair lead-time distribution,
    - computing a proposed inventory level based on said at least one characteristic,
    - determining a calculated customer service level corresponding to the proposed inventory level,
    - comparing the calculated customer service level with the desired customer service level, and
    - selecting the proposed inventory level as an optimized inventory level if the calculated customer service level is within a selected convergence threshold with respect to the desired customer service level; and
  - a memory that stores data to be used by the processor to execute the algorithm.

15. A method of maintaining an optimized rotatable inventory level, comprising:  
determining an optimized inventory level, the determining step including:
- selecting a desired customer service level;
  - obtaining at least one characteristic of a part repair lead-time distribution;
  - computing a proposed inventory level based on said at least one characteristic;
  - determining a calculated customer service level corresponding to the proposed inventory level;
  - comparing the calculated customer service level with the desired customer service level;
  - selecting the proposed inventory level as an optimized inventory level if the calculated customer service level is within a selected convergence threshold with respect to the desired customer service level; and
  - maintaining an inventory level responsive to said optimized inventory level.